

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for defining the degree of fullness in a mill and a load toe angle (ϕ_k) comprising,
 - a) measuring where there are used oscillations directed to occurring in the mill electric motor, in order to define the toe of the mill load composed of the mass to be ground,
 - b) obtaining wherein from obtained measurements ($P(n)$), there is defined wherein a mill oscillation phase (θ) is defined by using a frequency domain analysis, and
 - c) defining the degree of fullness in a mill and the load toe angle (ϕ_k) and that by means of the mill oscillation phase (θ), there is defined the load toe angle (ϕ_k).
2. (Original) A method according to claim 1, wherein in the frequency domain analysis of the mill oscillation, there is used oscillation related to mill power draw.
3. (Original) A method according to claim 1, wherein in the frequency domain analysis of the mill oscillation, there is used oscillation related to mill torque.
4. (Original) A method according to claim 2, wherein the frequency domain analysis of the mill power oscillation is carried out by means of a Fourier transformation.
5. (Original) A method according to claim 1, wherein in order to make the degree of fullness of the mill and the load toe angle (ϕ_k) independent of fluctuations in mill rotating speed, in each measurement there is measured the current angle of rotation of the mill, and by this measurement of the current angle of rotation, there are taken into account the speed fluctuations in the signal to be analyzed in frequency domain.

6. (Original) A method according to claim 1, wherein in the measurement of the angle of rotation, part of the angles of rotation of the mill are measured, and part are calculated from the measured angles by linear interpolation.
7. (Currently Amended) A method according to claim 1, wherein when defining the degree of fullness by means of the load toe angle, there is applied a mathematical model, ~~such as the JKMRC model.~~
8. (Currently Amended) A method according to claim 1, wherein in both the power measurement used when defining the mill degree of fullness[[, as well as]] and the degree of fullness [[as such,]] are utilized in order to calculate the ball charge of the mill.
9. (Original) A method according to claim 1, wherein the mill load toe angle used when defining the mill degree of fullness can be utilized in order to improve the grinding efficiency of the mill, when the point of impact of the grinding media is calculated by a mathematical model.
10. (New) The method according to claim 7, wherein the mathematical model is a JKMRC model.